CLAIMS

1) A method for the preparation of a modified host cell comprising the steps of

a) transfecting a host cell with at least one compound of interest to which a label is covalently coupled

b) isolating the transfected host cell

characterized in that the label provides to the host cell a non-inheritable trait.

2) A method according to claim 1, wherein isolation of the transfected host cell is established by direct separation of the host cells containing said label from host cells not containing said label.

3) A method according to claims 1 to 2, wherein isolation of the transfected host cell is established by using means that can distinguish and separate said transfected host cell containing said label from non-transfected host cells.

4) A method according to claims 1 to 3, wherein the label is selected from the group consisting of a fluorescent label, a luminescent label, a chemo-luminescent label, a magnetic label, an antigenic label, an enzymatic label or a radioactive label.

5) A method according to claim 3, wherein the label is a fluorescent label and the means for detection is a Fluorescent Activated Cell Sorter (FACS).

6) A method according to claims 1 to 5, wherein the transfected host cell of step b) is subsequently cultured.

7) A method according to claims 1 to 6 wherein the compound of interest is a compound able to change permanently or transiently a metabolic property of the host cell.

8) A method according to claims 1 to 7 wherein the compound of interest is selected from the group consisting of polynucleotides, proteins and metabolites.

9) A method according to claims 1 to 8 wherein the modified host cell is a prokaryotic cell, a eukaryotic cell, a mammalian cell or a plant cell.

10) A method for the preparation of a desired compound by a transformed host cell comprising the steps of

a) transfecting a host with at least one polynucleotide involved the production of said desired compound and which is covalently coupled to a label which provides to the host cell a non-inheritable trait

b) isolating the transfected host

c) culturing the transfected host under proliferating conditions

d) culturing the transfected host under conditions wherein the desired compound is produced

e) isolating the desired compound from the culture broth.

11) A method according to claim 10 wherein the polynucleotide is selected from the group consisting of DNA, RNA, short hairpin RNA, non-coding RNA, LNA, HNA, PNA.

12) A method according to claims 10 to 11 wherein the polynucleotide modifies the titer, stability, isolation and/or activity of said desired compound.

13) A method according to claims 10 to 12 wherein the desired compound is a protein.

14) A method according to claims 10 to 13 wherein the desired compound is an enzyme.

15) A method for the preparation of a desired metabolite by a transformed host cell comprising the steps of

a) transfecting a host cell with at least one polynucleotide involved in the production of said desired metabolite and which is covalently coupled to a label which provides to the host cell a non-inheritable trait

b) isolating the transfected host cell

c) culturing the transfected host cell under proliferating conditions

d) culturing the transfected host cell under conditions wherein the desired metabolite is produced

e) isolating the desired metabolite from the culture broth.

16) A method according to claim 15 wherein the polynucleotide is selected from the group consisting of DNA, RNA, short hairpin RNA, non-coding RNA, LNA, HNA, PNA.

17) A method according to claims 15 to 16, wherein the desired metabolite is a primary metabolite.

18) A method according to claims 15 to 16, wherein the desired metabolite is an amino acid, a steroid or a nucleotide.

19) A method according to claims 15 to 16, wherein the desired metabolite is a secondary metabolite.

20) A method according to claim 19, wherein the desired secondary metabolite is an antibiotic, a vitamin, an anti-infective, a macrolide, a polyketide, a pheromone, an alkaloid or a drug.

21) A method for the preparation of a desired biomass by a transformed host cell comprising the steps of

a) transfecting a host cell with at least one polynucleotide involved in the production of said desired biomass and which is covalently coupled to a label which provides to the host cell a non-inheritable trait

b) isolating the transfected host

c) culturing the transfected host under proliferating conditions

d) culturing the transfected host under conditions wherein the desired biomass is produced

e) isolating the desired biomass.

22) A method according to claim 21 wherein the polynucleotide is selected from the group consisting of DNA, RNA, short hairpin RNA, non-coding RNA, LNA, HNA, PNA.

23) A method according to claims 21 to 22, wherein the desired biomass is a yeast cell.

24) A method according to claims 21 to 23, wherein the desired biomass comprises a biocatalyst.

25) A method according to claims 21 to 24, wherein the desired biomass comprises screenable cells for drug discovery.

26) A polynucleotide for use in a method according to claims 15 to 20, which modifies the cellular metabolism via redirecting metabolic fluxes towards said metabolite.